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## ORIGINAL ARTICLES.

### SIMPLE DISCISSION OF LENS CAPSULE FOR CATARACT WITH COMPLICATIONS.

(CLINICAL REPORTS.)

W. H. LUEDDE, M.D.,

ST. LOUIS, MO.

Simple discession of the lens capsule for the removal of cataract in young people has the sanction of antiquity as well as almost universal popularity in modern times. It is true that some operators with large experience, among them Maj. Henry Smith, of India, prefer to resort to the regular extraction of the cataract even in children under six months of age. The reason for their preference is based on the immediate results obtained by the extraction of the cataract, instead of waiting for the slower dissolution of the lens through the aqueous humor. Their argument is that the secondary complications which require further surgical intervention, after the discession of the capsule, may come at an unguarded and unpropitious moment and thus more than counterbalance the undeniably greater safety of the operation of discession over extraction in the first instance.

The validity of this argument will always depend on the circumstances of the individuals requiring such attention. The intervention usually required is the removal of the lens by linear extraction on account of increase of tension from the very rapid swelling. In most of our clinics, as well as in our private practice, this secondary operation can be accomplished promptly and with less risk than an ordinary extraction.

Therefore, we find the great majority of authors continue to recommend discission as the operation of choice in young persons. There is some difference of opinion among operators as to the age limits for this operation. Some fix the maximum age at ten or fifteen years, while others have little hesitation in using this method up to thirty years. Czermak says it may be used in selected cases up to forty years of age.

It is not the ordinary complications of this operation with which this report is concerned; they have never given much trouble in our experience. In the following case, nothing unusual was suspected until it was found, after the lens masses were dissolved, that a large sector of the iris, about one-fourth of its circumference, had been folded back on itself. It could not be replaced by the use of myotics, and operation was refused. After several months the intraocular tension became high, and vision, which had been excellent after the solution of the lens, was totally lost.

Miss M. K., aged 24, was first seen March 28, 1909, on account of poor sight O.S., following a blow from a strap 15 years before. General health excellent. O.D. V. 16/12; O.S. V. 16/150.

Ophthalmoscope showed nothing pathological O.D., but in O.S. a diffuse central opacity of the lens was revealed with peripheral striations, especially in the upper segment. The pupil O.S. dilated perfectly under cocaine and euphthalmin (a 1 per cent. solution) permitting a fair view of the retinal vessels and disc. The fundus appeared to be entirely normal. Superficially, with oblique illumination, a thin nebulosity of the cornea in the horizontal meridian, slightly wider at the nasal end, confirmed her statement regarding the previous injury.

On May 11th, after the usual preliminary preparations, including the full dilatation of the pupil with atropin, a discission of the anterior lens capsule was done by a crucial incision at St. Luke's Hospital. There was rather more pain than usual during the second day after the operation. Some of the pain was referred to the left ear, but an examination by Dr. W. M. C. Bryan revealed nothing abnormal in the ear. The pain soon became less. The eye was kept constantly under atropin for ten weeks, until the debris of the dissolving lens had disappeared from the anterior chamber and there was no evidence of ciliary congestion. With correction for her ametropia the vision of O.S. now equalled 16/24.

While there had been rapid swelling and solution of the lens at the beginning and slight elevation of intraocular tension, it had not been sufficient to require intervention. As the pupil became clear it was noted that the upper temporal quadrant of the iris did not return to its normal position, as did the remainder, when the use of mydriatics was discontinued. Examination showed that the pupillary margin of the iris was tucked under in this sector, apparently folded back on itself, so that the visible breadth of the iris in the upper temporal quadrant was scarcely more than one-half what it was in other parts of its circumference. The use of pilocarpine and eserine solutions was without effect so far as the restoration of this segment to its proper position was concerned, though the miotic effect on the iris as a whole was pronounced. The patient was warned that this condition might lead to serious consequences if it were not corrected by an operation. She absolutely refused to consider an operation, especially as her sight with this eye was at this time practically perfect (16/19, with correction). She was given a solution of pilocarpin, in oil (1/120) to use t.i.d. She was kept under observation every two weeks for *eight months*, during which time no signs of glaucoma were manifest, her sight in this operated eye remaining *unimpaired*. At the end of the ninth month central vision had dropped to 16/30 O.S. with correction, and the tension was strongly plus. Again, the necessity for an operation was urged upon her, but in vain. As the patient was not dependent on the sight of this eye, in fact had not used it probably for the greater part of fifteen years, she could not be brought to realize her danger. She disappeared for over five months, and when she returned, the sight in that eye was reduced to counting fingers at four inches, and tension was 3+ (measurements with the Schiötz tonometer could not be made until later). The ophthalmoscope revealed a pupillary membrane through which a glaucomatous cupping of the optic disc could be faintly made out. Hopes of restoring sight to the left eye by an operation could no longer be held out. As a palliative measure she was given an eserin salicylate solution (1/240 in oil) to use night and morning. She had stopped the use of the miotic formerly ordered during the time she had stayed away.

It is now five and one-half years since this eye was operated on and four years since the visit just noted. The eye is now absolutely blind, but the use of the eserine salicylate as above ordered has been kept up and has fully controlled any untoward

symptoms. Measurements with the Schiötz tonometer, made from time to time, have shown that there has not been much change in the intraocular pressure during that time. They also demonstrated that a noticeable decline in the tension follows the use of the eserine. The highest measurement was 75 mm., the lowest 37 mm., and an average of about 60 mm., with which she is entirely comfortable. The use of the eserine sal. sol. once a day suffices to maintain the *status quo*. The deformity of the iris remains unchanged. The iris slopes from the periphery toward the center like a funnel, without bulging, as in iris bombe. The anterior chamber is deeper than before, due to the retraction of the iris. O.D. continues entirely normal with V.=16/10.

The development of glaucoma in this instance has no immediate connection with the swelling of the lens after discission. It belongs to that interesting group of cases where there is the remote development of high intraocular pressure due to the operation, but not always with connection so easily traceable as in this case. We have in this case a period of some eight months, during which there existed good sight and freedom from any inflammatory manifestations. However, there was a deformity of the iris brought about by the operation, which was threatening before symptoms of glaucoma were to be discovered.

As to the probable origin of this peculiar tucking under of the pupillary margin of the iris, we can only speculate, as the lens masses in the anterior chamber made any observation impossible at the time it occurred. It seems likely that the iris was folded back by the lens masses pressing forward and upward in the anterior chamber; perhaps the unfolding anterior capsule was pressed back in such a manner that the layer of iris was doubled on itself. Under the continued pressure and chemical irritation a sufficient inflammatory reaction was produced to cause the layers of the iris thus folded upon itself to become agglutinated.

Dor, in the *Encyclopédie Française*, reviews the interesting figures of Dalén and others regarding glaucoma after cataract operations. Among 94 cases, 46 were after "extraction combined with iridectomy", 11 after simple extraction, and 37 after discission. Of the latter, 27 followed discission of a membrane after simple cataract extraction, 8 of the same type came after combined extraction, and only two followed after discission of soft cataract as in our case. Though this report is over ten years old it shows the relative infrequency of this complication.

Of interest also is the time of onset of the glaucoma. According to Dalén, after combined extraction, glaucoma appeared in 6 cases during the first ten days, in 20 more during the first ten weeks, of which 9 were in the fourth and fifth weeks. The remainder were scattered, coming at the fourth, sixth, seventh, eighth, tenth, and twelfth months, one at twenty-two months, one at five years and a half, one at eight years, and one ten years after the operation.

After simple extraction, except two cases which occurred in the first few days after the operation, none were noted until ten months and after that in two, three, four, six, seven, ten, eleven, and twenty-two years, respectively.

Among the 37 cases of glaucoma that followed discission, 21 developed during the first nine days. In this respect our case, with an interval of eight months, is also rather unique.

The principal causes assigned for the pathological increase of intraocular tension were posterior synechia, prolapse of iris, or capsule into the wound, with chronic cyclitis or iritis. Raehlmann explains these cases which occur after traumatic cataract or needling by the blocking of the spaces of Fontana with the deposits of globulin derived from the broken down lens fibers. We may in such cases have continued high pressure even though the anterior chamber is deeper than normal.

We have then two possible causes which may have been acting together in our case, the duplication of the iris with posterior synechia between the iris and ciliary body, and the blocking of the spaces of Fontana by precipitates. The latter, however, seems less likely, as the onset of the glaucoma was more remote than usual after discission.

de Lapersonne, in reports on the relations of glaucoma and cataract made in 1904 and 1906, calls attention to another factor which should be considered. He attributes considerable importance to a defective elimination by the kidneys of *chlorides*, the retention of which produces, or rather may provoke a true cedema of the vitreus. He relates a case where glaucoma, appearing five weeks after extraction, yielded to dietetic treatment along these lines. More recently, A. E. Ewing (*AMERICAN JOURNAL OF OPHTHALMOLOGY*, July, 1914) has emphasized the apparent relation between glaucoma and the habitual excessive use of common salt in the food.

On questioning, our patient proves to be guilty of this apparent indiscretion in diet. She constantly and persistently "resalts" her



food. It seems doubtful if this dietary mistake could have brought on glaucoma in this case, as the other eye has remained entirely normal as to central vision, visual field, and intraocular pressure. If the cause were only dietary we should have a right to expect a binocular manifestation. However, as we shall see in another case reported in this connection, posterior synechiæ alone do not account for the occurrence of glaucoma, nor does the deposit of globulin. If so, one might expect glaucoma to happen more frequently after discission of soft cataract, whereas only two out of the ninety-four cases collected up to the time of Dalén's report came about thus. We may safely assume, until we are better informed, that a combination of these causes is not impossible, and that the theory of the excessive use of salt, according to Ewing, or of the defective elimination of chlorides, according to de Lapersonne, which are really essentially the same in effect, merit the most careful consideration in all similar cases.

Pain in the eye during the time that solution of the cataract is going on is almost invariably explained by the pressure of the swelling lens masses against the iris. It may therefore be opportune in this connection to report an instance where we sought in vain to relieve the pain in such a case until an acute suppuration in the post-ethmoidal and sphenoidal sinus on the corresponding side had been located and drained.

Miss M. S., aged 25, seen first July 27, 1912, on account of white spot in the left pupil which has been there for "some time." O.D V. 20/15, O.S. V. 3/150. Examination revealed a diffuse opacity in left lens, most pronounced in the upper segment, with a tiny corneal scar near the upper limbus and under it a small posterior synechia of the iris. This unmistakable evidence of a perforating injury which had produced the cataract, was not supported by any recollection on the part of the patient of circumstances that might have produced it. An X-ray photograph, taken to reveal a possible foreign body in the eye, showed nothing pathological. After the usual preliminary preparations and thorough atropinization of the eye, a discission of the anterior capsule of the cataractous lens was done, August 19, 1912. The solution of the lens proceeded slowly and without discomfort, full dilatation being maintained by the regular instillation of atropin. On January 2, 1913, four months after the operation, she suddenly began to have severe pain in this eye and the whole side of the head. To our surprise there was no objective sign of glaucoma, though the eye was congested moderately, and tender.

Very little relief was obtained from the frequent use of atropin in the eye and the internal exhibition of aspirin. Schiötz tonometer showed the tension in the affected eye to be not over 18 mm. A rhinological examination by Dr. F. C. Simon showed great swelling in the middle meatus of the nose on the left side and after shrinking the drainage of pus from the sinuses afforded prompt relief from pain. One month later there was a sudden rise in the intraocular tension of the operated eye to 59 mm. (Schiötz), though the pain was less severe than during the empyema of the nasal sinuses. A linear extraction was done at once with entire success. One month later vision in the operated eye was 16/30 with +13. D. Sph. Fifteen months later O.S. with +14 D. Sph. V. equals 16/96, and the ophthalmoscope shows a thin membrane in pupil. The eye is free from all signs of irritation O.D. or O.S.; tension equals 17 mm.

The value of the tonometer in deciding whether the pain in this case could be due to intraocular pressure can hardly be exaggerated. We rarely find glaucomatous pain unless the intraocular tension is at least 35 mm. Often patients remain comfortable with tension measuring more than 60 mm.

A slight difference in the tension between the sound and the operated eye might lead to a needless operation if we only followed the indication of finger measurements and the presence of pain.

The advice is usually given not to resort to discission in cases where there is a small pupil and posterior synechia. In the following case these conditions existed in one eye with quite a dense cataract, while in the other eye retinal detachment had destroyed hopes for good vision. The discission of the cataract, in spite of the small pupil and synechia, the age of the patient (36 years) and the fact that it was thrice repeated, was followed by the restoration of vision from merely recognizing the direction of hand movements at 3 feet to 20/19 with correction. The eye has remained in good condition for over five years.

A. C. N., male, single, age 36, first seen in September, 1908.

Eyes said to have been affected by "brain fever and epilepsy" in childhood. Claims to have lost the remainder of eyesight, suddenly, while lifting a steer, three years ago.

O.D. vision equalled direction of motions of hand at 3 feet. O.S. vision equalled the recognition of motion merely at 6 inches. The examination showed O.D. pupil 2.5 mm. in diameter, with striking whitish gray reflex of cataractous lens. No fundus reflex with ophthalmoscope.

O.S. beginning lens changes, indistinct view of fundus, extensive retinal detachment.

O.D. light projection good in every direction. O.S. perception of light only in center.

The use of atropin O.D. was practically without effect on the size of the pupil on account of extensive posterior synechia.

The history being quite vague concerning the onset of the trouble in O.D., it was decided not to risk a regular cataract extraction, but to do a discission of the anterior capsule through the very small pupil. This was done in September, 1908. In effect the operation is of the type sometimes referred to as the Dutch method of puncturing a cataract. The eye was thoroughly atropinized before the operation. The use of atropin was continued without interruption until complete recovery. Scarcely any reaction was evident after the operation. Six months later vision was precisely the same in this eye.

Further operative intervention was not attempted at that time because he was suffering from an acute suppuration in the antrum of highmore. Dr. F C. Simon also reported some involvement of the other nasal sinuses and removed several small polyps from the nose.

Two months later, the condition of the nose was reported excellent. After careful preliminary preparation discission of the lens O.D was repeated with Dr. Post's needle. Again the reaction, if any, was slight. Three months later, i.e., nearly a year after the first discission, the mass of lens substance in the pupil was needled again. Although scarcely any substance was extruded into the anterior chamber, there was a reaction after this third discission more pronounced than at any time previous.

In two weeks O.D. vision with +8. Sph.=3/75. The ophthalmoscope showed a faint fundus reflex, the pupil still almost filled with undissolved lens masses and membrane.

Nearly three months later, over a year after the first operation, this membrane was needled, and in a few days vision was found to be equal to 16/75 with +15.5 Sph. O.D. Examination with the ophthalmoscope now showed a large choroidal scar above, near equator, and a few shreds in the vitreous. Patient was put on small doses of Hg. Cl<sub>2</sub> which was continued for a year and a half, alternating occasionally with K.I. saturated solution, 30 drops t.i.d. His vision continued to improve. When last seen, a month ago, it equalled 20/19+ with +15. Sph.

The result in this case certainly justifies the operative proced-



ure. We have gained perfect sight with the minimum of risk. It is such cases as this that demonstrate the great value of the operation of discission.

In the first case the ultimate failure can be blamed on too free an incision of the lens capsule which led to a "stormy" reaction with the doubling up of a sector of the iris, etc. The free incision in that case was made because the age of the patient rendered it likely that a less radical incision would not be effective. Another argument against the small incision is that swelling of the lens within the capsule may make trouble in the posterior chamber. Our experience has proven that argument fallacious. With a small incision, repeated if necessary, we may look for the best results even in complicated cases.

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#### OPTIC ATROPHY IN TABES AND ITS TREATMENT BY NEOSALVARSAN.

J. E. Kingsley (*The Ophthalmoscope*, September 1, 1914) relates his experience in the treatment of tabetic optic atrophy with neosalvarsan as observed by him in the clinic of Prof. Stanculeanu in Bucharest. The former hoplessness of the condition under ordinary treatment is commented upon. The cases of optic atrophy are divided into two distinct classes by Kingsley: (1) Those which respond to the treatment, and (2) those which show no improvement whatever. At the Bucharest clinic the treatment is both local and general. Local treatment consists of galvanization. Subconjunctival injections of sodium chloride or mercury cyanide are also used. Tonic treatment consists of injections of strychnine every day for twenty injections. The general treatment is specific. Intravenous injections of neosalvarsan are given in a series of six to eight with a period of six or seven days between each injection. Under the treatment Kingsley observed two cases where a decided improvement was noted. An improvement in the acuity of perception is seldom observed; frequently, however, an enlargement of the field of vision and a marked improvement in the perception of colors is noted. The most favorable cases are those with vision above 1/10 and with good color perception or where blue only is affected. The case histories of five patients are given.

PARENCHYMATOUS KERATITIS IN ACQUIRED  
LUES.\*

BY WM. F. HARDY, M.D.,

ST. LOUIS, MO.

Parenchymatous keratitis, the result of acquired lues, is said to be not an uncommon condition. It is so stated at times by men of large experience who do not consider the condition of sufficient rarity or interest to report instances coming to their attention. However, the current ophthalmological literature in this respect is conspicuous by reason of the paucity of such reports. In the recording of the present case, I do not feel that there is a valid reason for presenting it except for the fact that it differed markedly in its clinical history and picture from the ordinarily described form of the affection.

There must still exist a doubt in the minds of some as to the occurrence of parenchymatous keratitis, the result of acquired lues, for Carpenter takes pains to make the following statement: "That the cornea may be involved in acquired syphilis can no longer be denied, inasmuch as at least 100 well authenticated cases have been recorded, in which, as a late secondary or tertiary symptom, diffuse interstitial keratitis appeared in patients suffering from syphilitic infection." Carpenter made this statement in 1908. Since then, a number of other cases have been recorded. Mohr recorded a series of cases of parenchymatous keratitis, four of which occurred in women, and in these luetic manifestation dated since marriage, so that parenchymatous keratitis, he states, may occur as a result of acquired lues after seven to fourteen years. Both Carpenter and Davis called attention to the paucity of reports in American literature.

The incidence of the disease due to acquired lues is stated by different writers to be from one-half to three per cent. of all cases of parenchymatous keratitis. Carpenter describes the symptomatology as follows: "With an onset insidious in character and without marked ciliary injection, the cornea is found to contain many irregularly outlined, gray, deeply placed, punctate lesions, beginning either in its central por-

\*Read at the Meeting of the Ophthalmic Section, St. Louis Medical Society, October 7, 1914.

tion, or more rarely in its periphery. These punctate lesions gradually fuse, and the cornea becomes opaque without decided involvement of its surface or of Descemet's membrane. Following the infiltration, vessels push from the periphery into the parenchyma of the cornea, but the vascularity is usually less pronounced than in the well-known salmon patch described by Hutchinson, in consequence of which lacrimation and photophobia are not prominent symptoms. The cornea after a short time begins to clear, and usually without marked signs of involvement of the uveal tract returns to almost normal transparency, resulting in a more or less complete cure in from five weeks to three months." This description is quoted in full in order to show by contrast the usual picture of the disease and the decided deviation from it in the case described in this paper.

Fage holds that parenchymatous keratitis may not only relapse, but that after apparent cure it may reappear after an interval of months or years. All the relapsing cases were, however, the result of hereditary lues. The affection is usually stated to be not only mild with slight iritic symptoms, but also to be unilateral. Stephenson thought that the disease was unilateral because of treatment, and that bilateral cases occurred in untreated patients. A majority of the cases reported have occurred at a time long after the initial lesion, as late even as ten or more years. Very few cases are reported as occurring one year or less after infection.

The case report is as follows:

C. R., male, aged 17 years, came under observation January 9, 1909, with the right eye affected. There was much photophobia and lacrimation. The eye had been sore one week. He gave a definite history of a primary lesion a little less than one year before. The history was also fairly definite as to secondaries. O.D. V.=18/240; O.S. V.=18/19.

The tentative diagnosis at the first visit was iritis. Soon, however, the true character of the affection declared itself. The corneal cloudiness became so bad after the left eye became involved that the patient had to be led about. The opacity in each cornea was very dense; salmon patch formation was marked in each eye. He was put in a hospital, and given roborant treatment in addition to inunctions daily of Hg. The process slowly subsided under general and local treatment, and considerable clearing of the corneæ took place. He was under constant observation for six months. When discharged, he had large cor-

neal clouds which compromised vision very much; vision= $18/240$ . When seen a year later, vision= $18/120$ , and the patient was able to hold a position as driver for a drug house. The left eye became involved about two months after the right one.

Here we had a case showing a typical picture of parenchymatous keratitis such as occurs with hereditary lues. Both eyes were involved, the affection was very severe and prolonged, and vision was much reduced. He had none of the stigmata usually associated with hereditary syphilis—no Hutchinson's teeth, no saddle nose, no rhagades, and no deafness. In view of the opinion held by Fage, it might be contended that this was a reappearance of a former parenchymatous keratitis due to hereditary lues. No history of a previous eye trouble was obtained, and, furthermore, an initial lesion and secondary manifestations seemed satisfactorily vouched for. It is possible for an individual to have hereditary lues, undergo cure and later acquire a fresh infection. Igersheimer in discussing the treatment of this disease refers to that possibility. He advises that all cases should be energetically treated with salvarsan and Hg. to avoid complications such as pathological changes in the nervous system. He states that an antisiphilitic course has no influence upon the keratitis itself. The effect of such treatment may be so successful that the patient may contract syphilis a second time.

The age of the patient here, 17 years, is well within the age limit of those cases generally accredited to hereditary lues. He was of a development equal to that of a boy of 20 years, was sexually active, and had on numerous occasions laid himself liable to venereal disease. His age, therefore, was not against acquired syphilis.

In reporting this case, I am cognizant of the fact that the issue may immediately be raised that this was an ordinary parenchymatous keratitis in an hereditary luetic and running a typical course. Arguments apparently in favor of this view are the age of the patient, the severity of the disease, the reduced vision from corneal opacities, and the fact that it was bilateral. Amat reported five cases, two bilateral, occurring from two to five years after infection. He found such cases in their clinical aspect did not differ from those due to hereditary syphilis. To rule out absolutely hereditary lues, not only the life history of the patient is necessary, but also the history of the father and mother, prenuptial and marital. For various reasons, this was

impossible. Had this patient been an hereditaryluetetic, it must be granted that he was cured of his lues, for on no other supposition can we admit of a new infection with initial lesion and secondaries. The question has been brought up before whether it is possible for an individual with the hereditary taint to acquire lues primarily and whether parenchymatous keratitis in such a case is due to the inherited rather than the acquired disease. M. Frank reported a case in which the question of the occurrence of this lesion in acquired syphilis was raised. The keratitis developed five years after an initial lesion and cleared up under mixed treatment. The blood test gave a positive Wassermann. The central incisors were slightly notched, and this, together with markings at the angles of the mouth, suggested inherited lues. As an additional test, it was suggested that a Wassermann of the parents be made.

It is probably definitely settled that lues, either hereditary or acquired, is curable, the best proof of this being the possibility of acquiring a true initial lesion and sequelæ. So in this individual and in any parallel case, even though an hereditary taint might be proved, we would still be justified in looking upon the acquired infection as the one giving rise to subsequent activeluetetic manifestations. In view of our present knowledge concerning the causative factor of syphilis, the *treponema pallidum*, it must be granted that when the organism is eradicated from the body, active processes are impossible. Degenerative changes inaugurated by the spirochæte can, of course, still progress after the organism has long since vanished. It is generally conceded that parenchymatous keratitis is due to the presence and activity of the spirochæte, and is not a degenerative process. J. Herbert Fisher looks upon parenchymatous keratitis from acquired lues as generally a tertiary manifestation. A. E. Davis states that it usually occurs as a late secondary sign of the disease or during relapses in the tertiary stage of the general disease.

Gifford made a strong plea for the prophylaxis of parenchymatous keratitis, referring principally to the hereditary form. It is for the very reason that treatment is more or less thoroughly carried out, that the corneal manifestations of acquired lues are relatively infrequent, that the condition is mild in type, and that it is usually unilateral. Where treatment has been given for but a short time or not at all, it is not unreasonable to expect a parenchymatous keratitis in an acquired lues to run a course analagous to that in the hereditary form.



It is interesting to note the claims of Igersheimer relative to the origin of specific keratitis parenchymatosa (*Wien. Med. Woch.*, March 14, 1914). It is to the effect that in syphilitic infants there are spirochætæ even in the healthy cornea. After a time these disappear but leave an anaphylactic condition against the metabolic products of the organism. Later should the spirochætæ become active in another part of the body and flood the system with their toxic products, then the cornea which has been previously sensitized becomes involved and we have the condition present known as parenchymatous keratitis.

The points I most desire to call attention to in this case report are:

(1) The age of the patient, young enough to have a keratitis due to hereditary lues, though it may occur at any age, but is unusual late in life, and old enough to acquire lues and suffer its corneal manifestation; (2) the fact that it was bilateral; (3) that it appeared within one year of the initial lesion; (4) that the keratitis was most severe and that iritic symptoms, photophobia and lacrimation were pronounced; (5) the dense opacification of the corneæ with typical "salmon patches," the clearing progressed to a considerable degree, permanent opacities, however, remaining—the process in its entirety appearing like a severe one such as occurs in the hereditary type of cases; (6) if we admit in such instances the possibility of the keratitis being due to a previous hereditary taint, then it will be necessary to revise all our theories concerning parenchymatous keratitis and the curability and transmissibility of syphilis.

#### BIBLIOGRAPHY.

- Stephenson—Trans. Op. Soc., U. K., May, 1907.  
Fisher—Trans. Op. Soc., U. K., November, 1907.  
A. E. Davis—Trans. Am. Med. Assn., 1908, p. 218.  
Gifford—Trans. Am. Med. Assn., 1909.  
Carpenter—Trans. Am. Op. Soc., 1908.  
Stephenson—Ophthalmoscope, February 1, 1909.  
Mohr—Pester Med. Chirurg. Presse, June 28, 1908.  
(Abstracted in Ophthalmoscope, September, 1908.)  
M. Frank—Ophth. Record, XXI, p. 289.  
Amat—Archiv. de Optal. Hisp. Amer., X, p. 313.  
Fage—La Clin. Ophtal., July, 1913.  
Igersheimer—Bericht d. Ophth. Gesell., Heidelberg, 1913.  
Igersheimer—Wien. Med. Woch., March, 14, 1914.

## TRANSLATIONS.

### THE ORBITOGENOUS BRAIN ABSCESS AND ITS OPERATION.\*

By A. ELSCHNIG, M.D.

(University Eye Clinic at Prague.)

(Translated by A. Alt, M.D.)

Abscesses formed in the brain in connection with suppuration in the middle ear, inner ear or mastoid process have been known for a long time. Neumann<sup>1</sup> who lately has written on these in extent, has been able to gather 196 cases of otogenous cerebellar abscess and 336 cases of abscess in the temporal lobe. Concerning the prognosis Heimanns<sup>2</sup> found that of 645 cases, of which the abscess was opened in 519, a cure was obtained in 193 cases. Neumann collected 196 cases from the years 1900 to 1905, of which about 2 per cent. were cured by operation; in something over 20 per cent. death occurred in spite of the opening of the abscess, while the others died on account of the impossibility to locate the abscess or to diagnose it, or because they came too late for treatment. Neumann's own cases give 25 per cent. of cures.

Of late only the rhinogenous brain abscesses have been given the necessary attention. After Kuhnt<sup>3</sup> in 1895 had been able to find only 17 cases of cerebral complication with suppuration of the frontal sinus, Gerber<sup>4</sup> in 1909 found already 140 cerebral complications in 473 cases of suppuration of the frontal sinus, 11 of which had been cured by operation. Engelmann<sup>5</sup> assumes 5 cerebral abscesses to 120 frontal sinus empyemata. Dreyfuss<sup>6</sup> gives statistics of 181 cases of accessory sinus suppurations and cerebral complications. In a recent paper he reports 30 cases of rhinogenous cerebral abscess, 3 of which were cured. Onodi<sup>7</sup> in 1908 found in literature 73 cases of rhinogenous brain abscesses with 7 cures.

Birch-Hirschfeld,<sup>8</sup> who in his article wrote more extensively on this subject, reports that concerning the frequency of cerebral abscesses and inflammatory complications within the skull,

\*Klin. Mtsbl. f. Augenhk., March-April, 1914.

he found in literature 20 cases of frontal sinus inflammations with a normal orbita, ending in death (7 with brain abscess), in empyema of the ethmoid labyrinth with orbital inflammation a mortality of 6 per cent. (1 brain abscess), and finally in empyema of the posterior ethmoid cells and the sphenoid cavity 15 deaths (2 brain abscesses).

Comparatively small attention has thus far been paid by ophthalmologists to brain abscesses due to suppuration in the orbita, which I prefer to designate as orbitogenous brain abscesses. This may be due to the fact that most of such cases have been handed over to rhinologists since they were secondary to accessory sinus suppurations. \* \* \* \*

\* \* \* \* The more ophthalmologists attend to the diagnosis and treatment of accessory sinus affections, the more the interest in the cerebral complications grows, and, on account of the absolute necessity of a quick diagnosis and a quick action, brain abscesses demand our especial attention. I should like in the following to report my experiences in this direction, the more since heretofore not a single case of orbitogenous brain abscess seems to have been diagnosed in vivo and cured, while I have succeeded in saving one patient by opening the abscess at the right time.

Case 1.—M. B., Marie, 23 years old, entered the clinic on December 10th, 1910. Has suffered for 1½ years from a swelling in the region of the right upper eyelid which only lately began to cause pain and grew somewhat more rapidly. Examination reveals a tumor in the region of the lacrimal gland, which was considered to spring from this gland, although with Schirmer's test the tear secretion was double that of the left eye.

December 14th.—Extirpation of tumor by the Kroenlein method. Suture.

December 15th.—Rising temperature with severe swelling of the region of the wound. Sutures suppurating. Streptococci in pus.

Although the wound was reopened widely and drained, severe swelling and suppuration of the orbital tissues developed, which did not stop till December 22, so that after normal temperature had been reached the wound could be closed by secondary suturing. It remained well drained.

December 31st.—Vomiting after constipation, no rise in temperature, no meningeal symptoms. (Prof. Marguliés.)

January 3rd, 1911.—In the evening severe spasms with al-

most ad maximum dilated pupils. Patient remained unconscious.

January 4th.—Rise of temperature to 37.2, pupils dilated. Right eye strongly abducted, both immobile. Patient perfectly unconscious. No signs of meningitis. Pulse 64. Suddenly death at 11:45 a.m.

The autopsy (Prof. Gohn) revealed an abscess in the right frontal lobe above the base with circumscribed adhesions of the lepto and pachymeningx; circumscribed pachymeningitis, ostitis, with a defect in the orbital roof the size of a lentil. Tuberculosis of the right tracheo-bronchial lymph glands, adhesive pleuritis. Histologically the tumor was found to be due to chronic tuberculosis of the lacrimal gland.

The experience in this first case of brain abscess after purulent inflammation in the orbit made it probable that such brain abscesses after orbital suppuration arise by continuity from an ostitis similar to what is, also, probable for the otogenous abscess. The case shows, furthermore, that had the abscess been diagnosed in time it could have been easily emptied by reopening the wound or by an incision along the upper orbital margin, freeing the roof of the orbit and chiselling out a piece of it. That these conclusions were correct was shown in the following case in which the diagnosis was made and the operation performed in time.

Case 2.—D., Franz, 12 years old, entered the clinic on October 11th, 1913. He had become ill about four weeks previously with signs of a phlegmone of the left upper lid which was promptly incised and some pus evacuated. A week later vomiting and attacks of severe headache made their appearance. Lately the patient has become almost somnolent, pulse slow.

When he entered the clinic we found the left palpebral fissure reduced in width on account of drooping of the upper lid; the left eyeball in normal position, freely moveable. Pupils equally wide, reacting normally. Ophthalmoscopically: the left papilla swollen 3 D. high, dark red; veins very wide, arteries on the papilla invisible, in the periphery normal. The right papilla swollen 2 D. high, somewhat more red than normal but not as intensely red as the left one, on the nasal apex of the papilla small, whitish spots. Bloodvessels like those in left.

Oto-rhinological examination (Prof. Piff) showed normal hearing and vestibular apparatus, some swelling of nasal mucous membrane, rhinitis.

The neurological examination by Professor Margulíes resulted

in the following: Patient complains of headache, but cannot describe its details. He is apathic, like being sleepy, with bland face. He reacts only on questions, and does not utter any wishes or complaints. Knee-jerk very vivid, right ankle clonus very plain, left barely noticeable. Left plantar reflex normal, right of indistinct type with tendency to dorsal flexion. Abdominal reflex equally present on both sides. Left plantar reflex stronger than right; triceps tendon reflex much stronger right than left. Corneal reflex present but diminished on both sides. Facial sensibility intact. Needle points are well distinguished in all parts of the body. The protruded tongue trembles, deviates perhaps somewhat to the right. Facial nerve and frontal wrinkles unchanged. Closure of lids normal, with Bell's phænomenon. Smell uncertain; certainly nothing, neither turpentine nor anilin, is smelt on the left; but the statements are, also, uncertain on the right side. In walking there is a slight tendency toward the right. Hand pressure is stronger on left. Active and passive resistance of upper and lower extremities are stronger on left. Temperature 38°; pulse 60.

Remembering the previous case of frontal brain abscess from orbital suppuration we assumed in this one with certainty a frontal brain abscess and located it at the base of the frontal lobe corresponding with anterior part of the orbital roof. I decided to open it from the orbit.

Beginning with the old scar a curved incision was made along the inner upper orbital margin, about 5 cm. long. The periosteum being incised the soft parts were crowded and held away from the bone. As the periosteum as well as the bone at the lower part of the inner orbital wall were slightly discolored, the small ethmoid cells were opened and their thickened mucous membrane removed. No pus, no communication with the nose. Then a piece of the orbital roof just behind the orbital margin 2 cm. long and 1½ broad was chiselled out and the dura laid bare. It was not particularly discolored, but did not pulsate. Puncture of the frontal lobe with a needle at once produced some drops of pus. Then the dura was split and excised in correspondence with the bone defect. The brain appeared somewhat discolored, red and did not pulsate. No pus or liquor between dura and brain. When the brain was incised 5 to 6 tablespoonfuls of creamy pus came out in a stream. Then the defect in the bone and the opening in the dura were further enlarged. The finger easily enters the abscess cavity, its walls are smooth, the neigh-



boring brain pulsates lively. Drainage with a long strip of gauze and thickest draining tube.

The pus contained numerous streptococci; on serum-agar pure streptococcus culture.

October 12.—General condition good. Temperature 38°.

October 13.—Maximal temperature, 37.1°. Patient talks normally, shows no symptoms of disease. Secretion is rapidly getting less.

October 20.—Lumbar puncture shows leucocytosis. The choked discs are slowly disappearing.

October 25.—Draining tube removed, only a narrow strip of gauze inserted. Two large furuncles opened on left cheek. The wound closes with strongly indrawn edges. No fever.

November 6.—On the left everything normal. S=1.25; only slight changes in papillæ optical. Patient walks about.

November 14.—Rhinologist (Prof. Piffel) finds hypertrophic mucous membrane, nothing pathological.

November 17.—We were startled by complaint of headache and a sudden rise of temperature to 37.5°. All we found was a reddened palate and small reddish erosions on the septum. The next day, temperature 38.5°, angina.

November 23.—Free from fever.

November 27.—There is a moderately indrawn scar at the inner upper orbital margin, slightly red,  $\frac{1}{4}$  cm. wide, slightly adherent to the bone. The upper lid protrudes slightly. The eyeball is pressed downward about 4 mm., no exophthalmus. Motility free, no diplopia. The ophthalmoscopic picture is normal. Discharged.

A neurological examination at that time showed: the tongue protruded straight forward, trembles strongly. Triceps and patellar reflexes equal and vivid. Plantar reflexes equal. No ankle clonus. Abdominal and cremaster reflexes equal. Pressure of hand stronger right than left. Movements of fingers better right than left. Active and passive resistance better right than left, every trace of a right-sided paresis has disappeared. Sensibility and sense of smell normal.

By accident we saw right after this case a third one of orbitogenous (rhinogenous) brain abscess, in which we made the diagnosis too late, so that the correct localization and the evacuation of the brain abscess from the orbita, as in Case 2, could no longer save the patient's life.

Case 3.—K., Leopold, 45 years old, entered the clinic on

September 3, 1913. For one month he had suffered with pain above the left eye, in the morning the upper lid was swollen. During the last three weeks sight had been failing; during the last week there was great swelling and pain. Lues 28 years ago; three courses of inunctions.

Immense protrusion of left upper lid, swelling at the inner upper orbital wall stretching far into the orbit, ptosis, diminished abduction, exophthalmus of 4 mm. Slight neuritis, but normal acuity of vision. Polypus nasi. Wassermann negative; Klausner's pallidine reaction positive.

September 12.—After removal of the polypus and polypoid hypertrophies at the nasal clinic, the entrance to the frontal sinus was opened and purulent secretion removed by syringing.

A course of inunctions had been begun on September 10.

September 13.—0.6 salvarsan intravenously. The treatment of the nose reduced the severity of the symptoms and the patient left the clinic on September 16, but returned on the 20th with the symptoms of beginning orbital phlegmone and considerable protrusion of the left eyeball temporally and downwards. A broad incision at the inner upper orbital margin bared the periosteum; in separating it farther back a closed subperiosteal pus cavity was found and drained. The symptoms receded rapidly.

October 16.—Professor Piffel found very little secretion, broad communication between frontal sinus and nose. The patient remained free from fever, the nose was continually treated in Piffel's clinic and the secretion from the orbital wound diminished; the drain, however, was not removed.

November 10.—The temperature rose to  $38.2^{\circ}$ ; this by the internist was thought to be due to intestinal irritation. In the next few days the temperature varied between  $36.8^{\circ}$  and  $38.5^{\circ}$ .

November 14.—Suddenly the patient, having walked about in the morning, became dull and aphasic. Examination by Dr. Pribram: Patient dull, strong rales over the whole lung. Pulse strong, 66 to 60; temperature  $37.6^{\circ}$ ; patellar reflex present, no ankle clonus, no Babinski. He takes the proffered hand, but does not react in any way when spoken to. When shown writing he nods (sensory aphasia?). The right extremity is moved. No opisthotonus; Kernig plain.

I saw the patient in this condition and heard from the nurse that he had complained of headaches for some days and called them unbearable during the afternoon. Ophthalmoscopically right, normal; left, slightly reddened and opaque papilla. Since

there was no opisthotonus and on account of slightly increased temperature and diminished pulse frequency, we diagnosed frontal brain abscess. The severe rales reminding us of pulmonary oedema forbade an immediate operation. Pribram ordered cupping, apomorphia subcutaneously, warm baths alternating with cold and warm douches. Soon after 12 m. the rales had disappeared and I could proceed to operate.

The wound at the orbital margin was reopened and enlarged. The atonic granulations filling the frontal sinus were scraped out and the orbital roof broadly resected with mallet and chisel. The dura was barely reddish and did not pulsate. Even before it was cut some pus trickled out which must have been located between dura and frontal lobe. A non-pulsating mass of brain came forward, the incision of which let out several spoonfuls of creamy pus. With the pus almost clear liquor spurted out. The opening in the orbital roof was enlarged to 4 square cm. and the dura removed. The palpating finger easily entered the abscess cavity, which seemed not large and surrounded by flaccid brain. A thick drain and a strip of gauze were put into the abscess cavity, the nose was closed with an iodoform gauze tampon, a second iodoform gauze tampon shut off the orbit from the nose. The most lateral part of the wound was stitched.

In the afternoon after the operation the tracheal rales returned. The patient still moved both extremities, but much less and only on strong skin irritation. Temperature increased. Leukocytes and erythrocytes increased. Much albumen in the urine and some cylinders. The rales continued to become worse and resisted therapeutic measures. Twice strophanthus injected intravenously up to 1 mgr. In the course of the afternoon a hemiparesis developed. Patient remained dull. At midnight temperature  $38.1^{\circ}$ , pulse 120.

November 15.—Bandages soaked with blood. Pulmonary oedema. At 1 p.m. temperature  $40.3^{\circ}$ ; at 5 p.m. death.

The pus from the abscess full of streptococci.

The post mortem findings by Dr. Lukoch gave: Dura mater of medium tension and thickness. Over the convexity of the left cerebral hemisphere a layer of thick, greenish pus 5 mm. thick, leptomeningx infiltrated with pus. At the base of the left frontal lobe purulent infiltration as above, fresh lighter-colored pus around chiasma; also for some distance on the right frontal lobe. Corresponding to the operative procedure there is in the region of the second frontal convolution a cavity which reaches for about

3 cm. upwards in the cerebral tissue. The whole left hemisphere is enlarged and œdematous. Cortex after removal of pus reddish gray in section. The right lateral ventricle enlarged, left normal, both filled with clear fluid. All sinuses of the dura mater normal. Slight swelling and redness of the nasal conchæ, left. From the orbit an opening 2 cm. wide leads into the left nasal cavity from the upper down to the middle concha, of which the anterior tip is wanting.

Emphysema of the lungs; to the right and downwards lobar pneumonia, slight excentric hypertrophy of the heart, chronic enlargement of the spleen, old tuberculosis in right apex.

Bacteriological examination (Professor Ghon): smears from meningitis pus give pus cells and only gram positive cocci in chains and clusters. Cultures: numerous colonies of staphylococcus pyogenes aureus; less numerous colonies of a non-hæmolytic streptococcus.

According to Ghons the abscess had been opened *lege artis*. Since its walls were not thickened it was not chronic, but a rather recent abscess, perhaps, three or four weeks old, while the meningitis was undoubtedly of more recent date. It is probable that the meningitis was secondary to a rupture of the abscess at the base, which, also, caused the encephalitis of the left frontal, parietal and temporal lobes, while the hydrocephalus internus of the right side was probably pre-existent. It was, also, shown that the location of the abscess was such that in order to reach it from the temporal fossa or from the forehead after trephining, a very thick layer of brain substance would have had to be pierced.

According to these my observations the opening of a frontal brain abscess from the orbit offers very marked advantages when compared with the opening from the temporal fossa and from in front. As Uhthoff,<sup>11</sup> too, has deduced from literature, the orbitogenous abscess is always located in the frontal brain and, as seen in my three cases, probably as a rule so near the orbital roof that opening it here causes the least damage to the brain, that it is least difficult to find it and can be perfectly emptied and drained. The chief advantage is, however, that brain prolapse, which must be feared with every larger trephining hole in the skull, is avoided. At any rate, a loss of bone in the skull in the region of the frontal brain, even if made under the temporal muscle, is not without importance and occasionally demands an osteoplastic secondary operation.

Two points might be argued against opening a frontal brain abscess from the orbit. First the fear that a prolapse of the brain into the orbit might occur, causing exophthalmus and its disagreeable consequences. This is refuted by the experience in my second case, as also in Schlosser's<sup>14</sup> case with tower skull in which an unnecessary large part of the orbital roof had been removed, and in which a considerable exophthalmus was seen to disappear in a very short time. It seems that the periosteum of the orbit gives sufficiently strong closure of the orbital roof.

The second might be the possibility of infection of the orbit from the brain abscess. This need, of course, not to be considered when the orbital tissue was previously inflamed, would, however, have to be taken into account, when, as in my second case, the brain abscess makes its appearance after the orbital abscess is healed. But, even here, experience seems to show that the uninjured periosteum, stripped from the bone gives sufficient protection against later infection. If this is true we must in future be especially careful in the operation and not to injure the insertion of the tarso-orbital fascia on the periosteum and to strip the periosteum clean from the orbital wall.

It is of especial value after the dura has been laid bare to watch the pulsation of the brain. In my cases neither the dura nor the brain around the abscess pulsated. Bergmann<sup>9</sup> states that lack of brain pulsation with intact dura shows in most cases the presence of fluid, especially pus directly under the dura.

The presence of pulsation, however, does not exclude the diagnosis of brain abscess. Hochenegg<sup>15</sup> states that with brain abscess the dura shows no pulsation. Moreover, should the abscess be situated deeper within the frontal lobe, it might be found by careful puncture even if it did not lie in the neighborhood of the orbit.

Orbital trephining and opening of a frontal sinus abscess should be reserved for purely orbitogenous abscesses, that is for cases in which there is no serious purulent affection of the sinus. It is probable that the orbital process which leads to cerebral abscess is generally, as certainly in our third and probably in our second case, due to an affection of the nasal accessory cavities. If there is a serious purulent affection of the frontal sinuses, the brain abscess may, as the surgeons state (Bergmann<sup>9</sup>), be attacked through the frontal sinus, although the drainage is not equally good and the knife has to penetrate through a thicker layer of brain substance than with the orbital method. Especially



in children whose frontal sinus is still very small and certainly gives less often cause to orbital processes than the ethmoid cells, the orbital opening of a frontal abscess is decidedly preferable.

As seen from the second case the broad detachment of the orbital periosteum, including the trochlea, had no effect on the integrity of the movements of the eyeball. As is known from experiences with Killian's and Hajek's radical frontal sinus operations, this encheiresis produces no, or at least, no lasting damage to the action of the superior oblique.

As regards the origin of the orbitogenous brain abscess, we must state that first Kuhn and later Dreyfuss have extensively studied the rhinogenous brain abscess and have established the fact that when pus cannot directly penetrate into the brain through bone fissures, the perforating bloodvessels furnish the way. In the same manner probably the orbitogenous brain abscess comes about. It seems that the uninjured periosteum offers a certain protection; it is therefore probable that in traumatic orbital phlegmones in which the periosteum, too, is injured, and in orbital purulent processes from accessory sinus affections in which the orbit is affected only after destruction of the periosteum, the conditions for the formation of a brain abscess are very favorable.

The very localization of the abscess argues for a direct contact infection—from orbital pus or micro-organisms—of the dura and the neighboring frontal brain lobe through the entrance of microbes through the thin orbital roof along bloodvessels, or by way of an otitis. It is, however, well known that brain abscess may, also, be due to thrombophlebitis of the orbital veins or of the cavernous sinus. The latter will, as a rule, probably not be as typically localized as the orbitogenous brain abscess.

Concerning the diagnosis of orbitogenous brain abscess we must point out that in its beginning, as in my three cases, it runs its course with only small increases of temperature, but with serious cerebral symptoms (headache, dizziness) and that its differential diagnosis from meningitis is possible only by the lack of the general meningitic symptoms and especially the low temperature. Only when symptoms of brain pressure (slow pulse, general brain symptoms) make their appearance it may be possible, as in my last two cases, to make a diagnosis with some certainty. On account of the typical localization of the abscess in the frontal lobe usually all focal symptoms are wanting; they appear only when portions of the frontal brain lying farther

back and the neighboring central convolution are drawn into the process by encephalitis or consecutive meningitis.

As our second case shows, the observation of just such minimal focal symptoms characteristic for the frontal brain may be of special importance. These are: the minutest signs of a contralateral hemiplegia (through action on the central convolutions), unequal unilateral increase of the reflexes, eventually ankle clonus and Babinski, small differences in the power of the extremities, as also symptoms of pressure on the olfactorius which will show on the affected side first. This symptom, however, is not trustworthy, because complications with basal meningitis and eventually a pre-existing rhinitis may, also, produce it. We have stated above that lumbar puncture is not without danger as an aid to diagnosis.

There is nothing to be hoped for from X-ray pictures.

The condition of the optic nerve is, of course, also, an important factor. In my first case both optici were normal, also in the last case in which the slight œdema of the left papilla could be explained as due to the orbital process. However, in the second case, there was a severe choked disc of the left and a moderate œdematous swelling, with some enlargement of the bloodvessels, of the right papilla.

According to Uhthoff a choked disc is observed in 23 per cent. of cerebral abscesses. Half of these cases were otitic, 9 per cent. metastatic, and 13 per cent. traumatic cerebral abscesses; in 28 per cent. the ætiology remained unknown. It is not improbable that a large part of these was due to nasal accessory sinus affections. Uhthoff found only 3.5 per cent. of all cases of choked disk due to cerebral abscess. When all alterations of the papilla are counted (choked disc, neuritis, neuritic atrophy) cerebral abscesses figured in 50 per cent., with Uhthoff's cases added in 44 per cent.

The preponderance of unilateral papilla changes has a relative value only in the localization diagnosis, since Uhthoff found the more pronounced papilla changes in only 4/5 of the cases on the side of the abscess. In 21 per cent. of cerebral abscesses slight neuritis optici ( $\frac{1}{8}$  of these unilateral), the neuritis almost always corresponding with the seat of the abscess.

These observations seem to show that the orbitogenous brain abscess is always located in the frontal lobe, that it can easily be reached from the orbit and that, therefore, it belongs into the sphere of the oculist as much as the otogenous brain abscess be-

longs into that of the aurist. The success of the operation depends on an early diagnosis.

## LITERATURE.

1. Neumann—Der otitische Kleinhirnabscess. Leipzig and Wien, 1907.
2. Heimann—Ein Fall von acutem otitischem Schläfenlappenabscess. Arch. f. Ohrenhkl., Vol. 66, p. 251, and Vol. 67, p. 11, 1906.
3. Kuhnt—Über die entzündlichen Erkrankungen der Stirnhöhlen, Wiesbaden, 1895.
4. Gerber—Die Complicationen der Stirnhöhlenentzündungen. Berlin, 1909.
5. Engelmann—Mentioned by Onodi (7).
6. Dreyfuss—(a) Die Krankheiten des Gehirns and seiner Adnexe im Gefolge von Nasenerkrankungen. Jena, 1896. (a) cited by Onodi (7).
7. Onodi—Das Gehirn and die Nebenhöhlen der Nase, 1908.
8. Birch-Hirschfeld—Krankheiten der Orbita. Graefe and Saemisch, Vol. 1X.
9. von Bergmann—Chirurgie des Kopfes, 1907.
10. Reis—Arch. f. Augenhkl., 1905, Vol. 53, p. 160.
11. Uhthoff—Augenveränderungen bei Erkrankungen des Gehirnes. Graefe and Saemisch, Vol. XI.
12. Oppenheim and Cassirer—Der Hirnabscess. Wien, 1909.
13. Lewandowski—Diagnose der Hirnabscesses. Med. Klin., IV, p. 1011 (1908).
14. Schloffer—Beitraege zur Klin. Chirurgie, Vol. 86, p. 265, and Klin. Mtsbl. f. Augenhkl., July, 1913.
15. Hochenegg—Lehrbuch der speziellen Chirurgie. Wien, 1907 p. 57.

## ANÆSTHETICS IN EYE WORK.

A. A. Bradburne (*British Med. Jour.*, October 17, 1914) recites an instance where in a patient of 74, with but one eye, a preliminary iridectomy was done, but spasm of the lids was so great that he was informed that it would be unsafe to remove the lens. Bradburne agreed to do the operation under a general anæsthetic. The extraction was easily and quickly completed. As soon as an attempt was made to lift the speculum it was followed by a vicious spasm of the ocular muscles with a great loss of vitreous. Cocaine had been used and the patient was deeply under the general anæsthetic, yet the spasm manifested itself. Bradburne suggests that it probably would be better in such a case to use deep orbital injections of cocaine as recommended by Dr. Traquair, or to have the eye held by means of the superior rectus.

## ABSTRACTS FROM MEDICAL LITERATURE.

BY W. F. HARDY, M.D.,  
ST. LOUIS, MO.

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### EXPERIMENTAL RESEARCHES IN METHYL ALCOHOL INHALATION.

H. H. Tyson and M. J. Schoenberg (*Jour. A. M. A.*, September 12, 1914), impressed with the importance of a careful study of the effects of methyl alcohol, carried out a series of experiments on animals. Particular attention was given to the effect of methyl alcohol inhalation in chronic cases. The effects of the experiments were the following: 1. In nose and mouth copious discharge and frothing. 2. Temperature: marked fall, varying from 1 to 10 degrees according to amount used, method and time of exposure to vapor. 3. Respiration: rate increased, then decreased below normal, being low just prior to death and ceasing before the heart. 4. Blood: increase in electroconductivity due to an increase in H-ion content; increased acidity with phenolphthalein as an indicator; coagulation time reduced, specific gravity increased; erythrocytes, leucocytes, hemoglobin and polymorphonuclears increased and lymphocytes decreased. 5. Necropsy findings: stomach empty, mucous membrane congested, punctate hæmorrhages. Trachea: pale. Lungs: few minute hæmorrhages on surface. Heart: muscle dark, in some cases, cavities empty. Liver: dark. Kidneys: dark purple, congested. Adrenals: hæmorrhage in one case. Spleen: dark indigo blue. Intestines: bloated, small punctate hæmorrhages. Brain: marked congestion of the meninges.

The effects on the eye were: Slight irritation, producing blinking, slight haziness of the cornea and no inflammation of the conjunctiva. Corneal reflex retained in some animals after others had disappeared. Fundus: hyperæmia and edema of the discs, with dilated dark veins and arteries. Pupil: moderate contraction in coma with loss of light reaction. Tension varies with intensity of toxemia, in mild recoverable cases being normal, and in profound coma showing marked hypotension, which, when less than 5 mm. Hg. by tonometer, indicated a rapid and fatal termination within about twenty-four hours.

Microscopic findings indicate an edema of the tissues with very early signs of beginning degeneration of the ganglion-cell layer of the retina. In reviewing the results of the experiments, attention is directed to the similarity with those obtained through experimental researches and clinical observations in the internal administration of methyl alcohol; thus demonstrating its fatal and profound toxicity irrespective of the method of its entrance into the animal organism.

The prohibition of the manufacture of methyl alcohol is urged and the use of specially denatured alcohol recommended instead.

#### THE EVOLUTION OF TOXÆMIC IRITIS.

In an address before the Oxford Ophthalmological Congress, July, 1914 (*British Med. Jour.*, September 26, 1914), W. M. Beaumont took as his subject the evolution of toxæmic iritis. He states that the hæmatogenous theory of infection has led to the ætiological dethronement of iritis from the position of an independent disease to the secondary one of a complication. We direct attention now more to the cause than to the treatment of the local manifestation. Iritis is commonly associated with arthritis and arthritic pains. Acute rheumatism, however, is virtually never coincident with iritis. In acute rheumatism the toxins do not find in the iris a suitable nidus. Many cases of so-called rheumatic iritis occur in the subjects of gonorrhœal infection. Objection is raised to the term idiopathic iritis. The suggestion that iritis might be due to a toxæmic condition was contemporaneous with the doubts regarding rheumatism as a frequent cause of iritis. Gonorrhœa has long been recognized as a cause of iritis, but only where it was acutely present. Now, however, we know that foci of gonococci may remain latent for many years and then later on take on activity. Great attention is now paid to possible areas of infection, be they in the nose sinuses, alveolar pockets, gastro-intestinal tract or prostate. Septic absorption from these areas may be the ætiological factor in a given case of iritis. Beaumont thinks that not only iritis but conjunctivitis may be produced endogenously by gonorrhœa. In these cases of conjunctivitis there is usually evidence of systemic infection, such as metastases in the joints, tendons or endocardium. Iritis in toxæmia generally indicates an intense systemic infection and there are usually present the dull sallow



complexion, constipation, neurasthenia and lassitude. The association of dental disease with iritis is perhaps more generally observed than are other sources of sepsis. Lang's statistics are quoted as showing that about 64 per cent. of cases of iritis attributed to sepsis are caused by pyorrhœa; this is due no doubt to the great prevalence of pyorrhœa. One should not be prejudiced, however, by the presence of a pyorrhœa and lose sight of a possible gonorrhœal, luetic or other infection. Attention to dental sepsis is imperative, and Beaumont naively says that it is better to lose thirty-two teeth than one eye. Treatment in toxæmic iritis calls first for detailed hygiene. Vaccines, Beaumont states, have proved disappointing in treatment. Mercury with chalk has been a valuable therapeutic adjuvant.

#### FURTHER OBSERVATIONS ON THE HEMIOPIC PUPILLARY REACTION OBTAINED WITH A NEW CLINICAL INSTRUMENT.

Clifford B. Walker (*Jour. A. M. A.*, September 5, 1914), in an article showing much original work and thought dealing with his experiments and apparatus used to determine the value of the Wernicke hemiopic pupillary reaction, comes to the conclusion that the Wernicke sign cannot be relied upon. He states that from a careful study of the cases he reports, apparently many conclusions may be drawn of which the following would appear particularly justifiable:

1. A weak hemiopic pupillary reaction may be masked by the pupillometer light when observed consensually.
2. Light and dark adaptive phenomena in addition to dispersion light, seriously complicate the hemiopic pupillary reaction.
3. The hemiopic pupillary reaction is definitely present in anterior lesions, when examined by the rotary shutter method.
4. The hemiopic pupillary reaction is also present in cases having every clinical evidence of being purely posterior cases, although necropsy examination is necessary to prove absolutely that there is no involvement of the optic tract or primary ganglion centers.
5. Although it may be concluded from the examination of these cases that the peripheral retina does possess a weak pupillomotor sensitiveness, there is no evidence that the hemiopic pupillary reaction has any topical diagnostic value.

A CONTRIBUTION TO THE EXPERIMENTAL STUDY  
OF OCULAR ANAPHYLAXIS.

In a most interesting article on this intensely interesting subject M. J. Schoenberg (*Ophthalmology*, October, 1914) discusses this not widely known phase of ocular pathology. For this essay, Schoenberg was awarded the Lucien Howe prize for 1914 of the Medical Society of the State of New York.

Anaphylaxis is defined as the opposite of protection (phylaxis or prophylaxis) and is a condition in which the cells of the animal organism are so modified by their first contact with a heterogenous albumin as to react with greater intensity when the same organism is confronted a second time with the same heterogenous albumin. A certain time (period of incubation) must elapse after the first introduction of the foreign protein to the body before the organism is "sensitized." Anaphylactic shock, in the guinea pig which is very susceptible, is evidenced by rapid breathing, restlessness, convulsions and death. The theoretical and practical significance of anaphylaxis is: (1) Anaphylaxis offers us a new method of identification of various kinds of albumin. (2) The study of anaphylaxis throws light on that puzzling condition called idiosyncrasy and "individual physiology." (3) Anaphylaxis is an albumin disease in the broadest sense. It is a pathological condition produced by something else than by trauma, bacterial poison or heredity. (4) Extracts of various tissues of the eyes have been used with success as antigens in the production of experimental anaphylaxis. (5) Anaphylaxis may be produced in the organism without the parenteral introduction of a foreign albumin. This constitutes autoanaphylaxis. (6) The hypersensitiveness of the tuberculous patient to tuberculin subcutaneously, intradermally or in the conjunctival sac is but a form of anaphylaxis. (7) The passive immunization with immune body containing serums possesses an element of danger. (8) Hay fever, urticaria, eclampsia and other diseases are enumerated as diseases due to anaphylaxis, by Wolff-Eisner. (9) Anaphylaxis and heredity have certain points in common. (10) In ophthalmology anaphylaxis has been applied explanatory of certain ocular affections, such, for instance, as interstitial keratitis, phlyctenular keratitis and sympathetic ophthalmia.

For the production of anaphylaxis three conditions must be fulfilled: (1) The substance introduced must be a heterogenous

albumin. (2) The route of introduction must be parenteral, i.e., not through the alimentary tract. (3) A period of incubation must elapse after the first injection.

Schoenberg states that on general principles it is to be admitted that the eye being an organ very intimately connected with the rest of the organism (lymphatics, bloodvessels, nerves, connective tissue, etc.), participates in all that is going on in the other parts of the body. From experiments made by previous investigators it is concluded that the process of immunization starting in the eye may extend to the rest of the body and vice versa. The study of anaphylaxis has evolved along lines similar to the study of immunity in its relation to the visual apparatus. The main questions involved are three: First, Does the eye participate in the process when the entire organism is in a state of anaphylaxis? Second, Can we sensitize the entire organism by introducing into the eye a heterogenous albumin? Third, Is it possible that a state of anaphylaxis should occur in the animal body without the introduction of a foreign albumin? (autoanaphylaxis.) Schoenberg used for his experiments on rabbits, as a foreign albumin, either human serum or tuberculin B.E. He states that some of the problems to be worked out are: Can we hypersensitize the organism by injecting tuberculin into the eye? Can we hypersensitize the eye by injecting tuberculin into some other part of the body? The technic is given in detail. It is manifestly impossible to abstract such an article and do it justice. A perusal of the original in full well repays one. Experiments and investigations along these lines give promise of clarifying some of the complex problems now confronting us, in general medicine as well as in ophthalmology.

#### CASES OF RECOVERY FROM DETACHMENT OF THE RETINA.

Chas. Higgins (*Lancet*, September 12, 1914) reported a case of cured detachment of the retina at a meeting of the Ophthalmological Society in 1902. The present paper is a supplementary report showing that the patient at the present time is perfectly well of the detachment. Two other case reports similar to the first are also given. In two of the patients there was present a high myopia. Treatment consisted of rest in the recumbent position the greater part of the day, and vapor baths followed by the inunction of mercury. Higgins condemns all operative measures as worse than useless. He has seen no case benefitted by

operation, but has seen some made worse. The treatment which seems to hold out the best, if only a slight hope of cure, is by rest in the horizontal position continued for weeks and measures which may be supposed to cause removal of fluids—such as sweating, purgation, absorbents and abstinence from fluid nourishment as far as it is possible to live without it. Higgins concludes by expressing grave doubts as to whether the results in his cases were due to the treatment adopted or were merely coincident with it.

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## BOOK REVIEWS.

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THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by C. A. Wood, M.D., C.M., D.C.L. Assisted by a large staff of collaborators. Fully illustrated. Volume IV, Cocaine to Conjunctivitis Phlyctenulosa Miliosis. Chicago: Cleveland Press, 1914.

We have previously had occasion to draw attention to the completeness and general excellence of this encyclopedia. The fourth volume is like its predecessors in these particulars. Besides numerous smaller articles of much merit, we find in it of particular importance the excellent article on comparative ophthalmology by the Editor, assisted especially by J. R. Slonaker, and the very complete article by W. F. Hardy on congenital anomalies of the eye. Each of these two articles forms a textbook by itself. Color perception and all pertaining to this subject is another chapter which receives the fullest consideration in this volume. Numerous illustrations and some plates in color add to the usefulness of the articles.

The debt the oculistic world owes to the Editor and Publishers of this first American Encyclopedia becomes more apparent with every volume.

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